

Name: _____

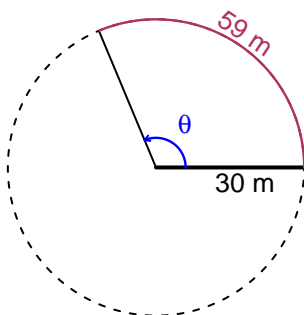
Date: _____

Trig Final (TEST v650)

- You should have a calculator (like [Desmos](#)) and a [unit-circle](#) reference sheet.

Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The arc length is 59 meters. The radius is 30 meters. What is the angle measure in radians?

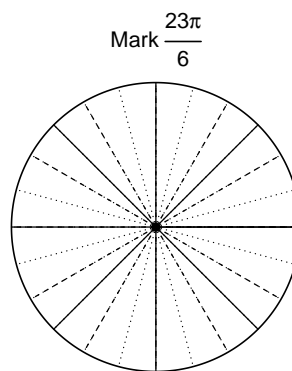


Question 2

Consider angles $-\frac{15\pi}{4}$ and $\frac{23\pi}{6}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(-\frac{15\pi}{4}\right)$ and $\cos\left(\frac{23\pi}{6}\right)$ by using a unit circle (provided separately).



Find $\sin(-15\pi/4)$



Find $\cos(23\pi/6)$

Question 3

If $\sin(\theta) = \frac{-21}{29}$, and θ is in quadrant IV, determine an exact value for $\cos(\theta)$.

Question 4

A mass-spring system oscillates vertically with a frequency of 3.65 Hz, an amplitude of 5.39 meters, and a midline at $y = -8.85$ meters. At $t = 0$, the mass is at the maximum height. Write an equation to model the height (y in meters) as a function of time (t in seconds).